NOTES.

M. MOISSAN has been elected President of the Chemical Society of Paris.

M. ROUCHÉ has been elected Académicien libre of the Paris Academy of Sciences, in the place of the late Baron Larrey.

MR. ALEXANDER AGASSIZ, having finished his surveys of the coral-formations in the West Indies, has made arrangements to explore the Great Barrier Reef of Australia, and proposes to leave America for Brisbane, for that purpose, with a staff of assistants, early in March next.

THE valuable conchological collection formed by the late Miss Jane Saul, was bequeathed by her to the University of Cambridge, and has lately been received by the Museum of Zoology. The collection is principally remarkable for the magnificent series of the genus *Cypræa*, in which are included several species of great rarity.

OUR U.S. correspondent writes: "The announcement was made last August, that the New York Botanical Garden had received 250,000 dols. of the 500,000 dols. necessary to start it properly. Progress is now reported in raising the remaining 250,000 dols., Mrs. Esther Herrman, of New York, having contributed 5000 dols. Miss Helen Gould, sister of Countess Castellane, has given Vassar College 8000 dols. to endow a scholarship. Mr. Abram Abraham, of Brooklyn, recently empowered the President of Cornell University to purchase the Oriental library of Ernest Rénan as a gift to the University, but news has just been received that the widow of Rénan's publisher has given the library to the Bibliothêque Nationale. It is announced that the electrical exhibition to be held at New York, May 4-June 1, will be the most elaborate ever held in America. Barnard College, one of the new colleges for women, has recently raised a fund sufficient to secure it a permanent home, and will erect a $500,000 building next spring, on the corner of 119th Street and Boulevard New York, near the new site of Columbia College, with which Barnard is affiliated."

THE *Pharmaceutical Journal* states that a Committee has been appointed by Prof. Alfred Dohme, Chairman of the Scientific Section of the American Pharmaceutical Association, to direct investigations in the pharmacognosy, chemistry, biology, histology, &c., of drugs. The Committee consists of Prof. A. B. Prescott, of Ann Arbor, President; Prof. Edward Kremers, University of Wisconsin; Prof. L. E. Sayre, University of Kansas; Prof. John U. Lloyd, President of the Cincinnati College of Pharmacy; Prof. Samuel P. Sadtler, Philadelphia College of Pharmacy; and Dr. Charles Rice, Chairman of the National Committee on the Revision of the United States Pharmacopœia.

A NEW immense domain, full of interest for the naturalist and the anthropologist, is now opened for scientific exploration by the great Trans-Siberian railway. Last month the rails were laid on this line as far as Krasnoyarsk, on the Yenisei, and next summer the explorer will be able to reach by rail the banks of the Yenisei, at a distance of 3057 miles from St. Petersburg. With the cheapness of railway communication in Russia—a second-class return ticket from St. Petersburg to Omsk (2673 miles) costs about eight pounds—and the facilities opened for navigation by the great rivers running northwards, Siberia is sure to become soon a favourite field for scientific explorers.

SOME information concerning the Russian geological expedition which visited Novaya Zemlya last summer, was given by the geologist, M. Tchernyscheff, at the meeting of the Russian Geographical Society on January 2, and at the Mineralogical Society on January 8. The Matochkin Shar, which divides the great island into two parts, was visited, but could not be explored over its full length, on account of the ice stocked in its eastern portion. The expedition crossed Novaya Zemlya in the latitude of Karmakuly, and returned laden with rich geological collections. Undoubted proofs have been found of the secular raising of, at least, the southern island of Novaya Zemlya. This island is built up of Palæozoic rocks (Devonian and the "Artinsk" strata), which are covered with Post-Tertiary deposits. It bears traces of a wide glaciation which was followed by submergence, as shown by several beach-terraces, wide deltas, and lakes. At the present time it is in a period of upheaval.

UPON application of the Middlesex County Council the Home Secretary has made the following order, dated January 29: 1. "The Wild Birds Protection Act, 1880," shall apply within the county of Middlesex to the wryneck (cuckoo's mate or snake bird), swallow, martin (2), swift, bearded tit (reedling or reed pheasant), shrikes, kestrel, merlin, hobby, buzzard, honey buzzard, osprey, and magpie, as if those species were included in the schedule to the said Act. 2. The taking or destroying of the eggs of the following wild birds is prohibited within the county of Middlesex, viz. nightingale, goldfinch, lark, nightjar, woodpeckers, kingfisher, cuckoo, owls, kestrel, buzzard, honey buzzard, merlin, hobby, osprey, wryneck (cuckoo's mate or snake bird), swallow, martins (2), swift, bearded tit (reedling or reed pheasant), shrikes, magpie, wheatear, stonechat, whinchat, red start, fly catchers, sedge warbler, reed warbler, blackcap, garden warbler, wood warbler, willow warbler, chiff-chaff, white throat lesser white throat, long-tailed tit, nuthatch, wren, gold-crested wren, wagtails (4), hawfinch, linnet, buntings (3), starling, landrail or corncrake, and coot.

PROF. IRA REMSEN describes in *Science* an interesting case of the accumulation of marsh gas under ice. It appears that a number of skaters were on a large artificial lake upon which remarkably clear ice had formed. In various places white spots were noticed in the ice, suggesting air-bubbles. Some one bored a hole through one of these white places, and applied a flame to the gas, which took fire. This led to further experiments, and it was found that, by boring a small hole, a long thin jet of flame could be obtained, and this continued for some time. The gas was marsh gas, formed by the decomposition of the vegetable matter at the bottom of the lake. Prof. Remsen remarks that this method of demonstrating the formation of marsh gas in nature is, from the æsthetic point of view, a great improvement on the usual method described in text-books, which consists in stirring a pool of stagnant water with a stick, and collecting the gas that rises to the surface. He suggests skating ponds illuminated by natural gas as among the possibilities of the future.

THE occurrence of a second period of very high barometric pressure in these islands during the month of January is noteworthy. The *Daily Weather Report* of the 28th showed that an anticyclonic area was spreading over the south-west of England, and at 11 p.m. on the 29th the high reading of 30·96 was recorded at Roche's Point, in the south of Ireland, and readings reached or exceeded 30·9 inches all over the south-western portions of England and Ireland. In London a maximum of 30·93 inches was reached, which corresponded with the reading there on the 9th of the same month. Such high readings have not occurred there since January 18, 1882 (when the barometer rose to 30·975 inches), and have been extremely rare during the last century. A peculiar feature of this high barometric pressure has been the mildness and dampness of the weather; although some rather low temperatures were recorded by thermometers exposed to the sky, the maximum readings have reached 45° to 50° during the day-time. It will be remembered that this period last year was one of almost continuous, severe frost, which lasted until February 20.

IT was pointed out in a recent article in the *Engineer*, that the introduction of warlike stores, and their final inspection and sentence, is entirely in the hands of naval and military men. The matter is again referred to in the current number of our contemporary as follows: "The actual manufacture only is under a civilian Director-General, but, with the exception of the Small Arms Factory at Enfield, the superintendents and their assistants were still all naval or military officers, and have remained so since the reorganisation carried out by an officer of the artillery in 1887. A colonel of artillery and two captains of the same arm manage the Royal Laboratory; a captain of the Navy and a lieutenant manage the Royal Gun Factory; a colonel of engineers is responsible for the Royal Carriage Department; a colonel of artillery, a captain, and a lieutenant, are responsible for the Royal Gunpowder Factory; and a colonel of artillery manages the factory in Birmingham. The Director-General has two military assistants, one a commander in the Navy, and one a captain in the artillery, and it would thus appear that he is assisted by no less than twelve officers of the Army and Navy, and therefore if the work turned out to be bad and dear—as it is alleged to be by the writers in the *Times*—that circumstance seems to us to be a strong argument in favour of the proposition that military and naval men are unfit, from want of technical knowledge and special training as manufacturers, to carry on manufacturing operations, and confirms the view which we have expressed of the imprudence of placing important factories under such management, and thus severely hampering a competent civilian Director-General. . . . In our judgment no substantial improvement in economical management is to be looked for till there is a complete separation between the military advisers of the Director-General and the civil assistants who are charged with the actual carrying out of the work and the keeping of the accounts."

THE question of the relation of psychology to physiology, and of the line of demarcation between the two sciences, is discussed by Prof. G. S. Fullerton in the *Psychological Review* for January. Psychologists are often charged with occupying themselves in doing work which is purely physiological, and they retort by stating that most text-books of physiology include matter which belongs to psychology. The fundamental assumption of psychology is, to state Prof. Fullerton's argument, the assumption of an external physical world, and of minds which mirror it. It is the task of the psychologist, with the aid of introspection, observation and experiment, to obtain a knowledge of such minds, and to reduce their phenomena to laws. Though little is known about the changes in a nerve during a passage of a nervous impulse, the methods employed in investigating physical and chemical problems may be expected to throw some light upon them. On the other hand, argues Prof. Fullerton, psychical facts—such as sensations, perceptions, volitions—have also to be reckoned with, and one would hardly expect to study them just as the changes in a muscle during contraction are studied. Therefore he thinks that while the task of the physiologist is to investigate, by directly objective methods, the physical series of causes and effects, the psychologist studies facts of another order by the method of introspection, observation and experiment, and interpretation.

IN a recent note we congratulated those interested in astronomy upon the fact that there would be soon a total solar eclipse visible almost at our doors, and that the Orient Company, Messrs. Cook, and Messrs. Gaze were advertising special steamers to go to Norway for the benefit of would-be observers. Then we went on to say: "We notice with some astonishment, in a circular issued by Messrs. Gaze and Son, the statement that 'an official party of observers, arranged by a joint committee of the Royal Society and of the Astronomical Society, are proceeding to Norway, and will travel by the s.s. *Norse King*.' We hardly think that this statement is authoritative, for scientific committees are not in the habit of advertising their intention to patronise any particular line of steamers; and, further, astronomers usually require more than five days to adjust and set up their instruments if any work of real use to science is to be done." We have received a letter from Messrs. Gaze and Son complaining that the above paragraph is "inaccurate," and assuring us that "an official party will travel by the *Norse King*." We willingly comply with their request, pointing out at the same time that we have been guilty of no inaccuracy, and that we did not deny their statement. We are not in a position to do so because, so far as we know, the Committee has published nothing on the subject. What we said was that it was not *authoritative*, and a statement of the kind made in an advertisement cannot surely be taken as authoritative even when it is used as a decoy. In any case we trust the "official party," whether singular or plural, will have a good time; but we still hold to our opinion as to the too short interval allowed for the preliminary arrangements on the spot.

MANY attacks have been made on the six zoological regions of Sclater and Wallace, and one of the most determined of these has been the proposal of an "Holarctic" region, to embrace the circumpolar districts and adjoining lands of both hemispheres. Dr. Scharff is a supporter of this view, which has likewise been maintained with great vigour by Dr. Merriam in America. But Dr. Wallace has shown that all the facts brought forward in its favour may easily be reconciled with the more orthodox view. An essay, entitled "Étude sur les Mammifères de la Région Holarctique et leurs relations avec ceux des Regions voisines," by Dr. R. F. Scharff, has just been published as an excerpt from the *Mémoires* of the French Zoological Society. In the essay, which has been rewarded by a prize founded at the International Zoological Congress held at Moscow, Dr. Scharff commences by a discussion of the Mammal-fauna of Ireland, and traces the species now existing and recently extinct in that country to their places of origin, so far as these can be settled by geological evidence. He proceeds to Southern Europe and Northern Africa, and shows how the Mammals that now inhabit these portions of the Palæarctic region may have reached their present quarters. There is much information to be gathered from the facts brought together by Dr. Scharff, but we cannot say that he has carried the case in favour of the "Holarctic" region much further than previous supporters of that theory.

THE number just issued of the *Arbeiten aus dem Kaiserlichen Gesundheitsamte* contains an official report by Regierungsrath Dr. Rahts, on the outbreak of influenza which occurred in Germany during the winter of 1893–94. In this epidemic, the country population suffered far more severely than that of the towns, and it is interesting to note that Hamburg experienced an exceptionally light visitation of the disease, this being doubtless partly attributable to the cholera epidemic of the previous year having eliminated to a certain extent the less vigorous lives. The period of incubation appears to have varied from two to five days, and the infectious nature of influenza was again amply verified. It is pointed out that the careful disinfection of all catarrhal expectoration is of great importance in preventing the spread of the contagion, and the successful manner in which outbreaks were restricted is ascribed to such disinfection having been carried out on the same lines as those laid down in the case of tuberculous infectious material. On the whole the report does not throw any important fresh light on this mysterious disease, and its latest appearance in epidemic form does not appear to have differed very materially from that which has characterised previous outbreaks. No reference is made to the bacteriology of influenza.

AN important and most elaborately conducted inquiry has recently been made by Dr. Lösener on the opportunity for spreading disease offered by the burial instead of cremation of infected carcases. The actual conditions attending the process of burial were as far as possible faithfully followed, both as regards the depth of the hole and the enclosure of the carcase. The duration of vitality of the various pathogenic microbes under such circumstances was found to vary very considerably. Thus typhoid bacilli only on one occasion survived the processes of putrefaction 96 days, cholera vibrios could not be detected after 28 days, tubercle bacilli lived from 95 to 123 days. Tetanus bacilli were, however, still in a highly virulent condition even after 234 days, but after the lapse of 361 days they were no longer discoverable. The bacillus pyocyaneus lived up to 33 days, and Friedländer's pneumonia bacillus 28 days; whilst anthrax germs retained their full complement of virulence during the whole year over which the investigations extended. As regards infection of the surroundings, the information is so far satisfactory, inasmuch as only in the case of anthrax germs were they discovered to have found their way to the adjacent soil and water. So admirable a barrier, however, is provided by the soil, that the earth close beneath the bottom of the hole containing the infected carcase, was in every case found to be quite devoid of pathogenic germs. The bacterial purification effected by filtration through soil has been shown by the Massachusetts experiments on sewage in which five feet of garden soil and five feet of peat were respectively used. So few microbes found their way through, that they were not attributable to the filtration itself, but rather to post-filtration sources. Of course for practical filtration purposes these materials are not available, as they work so very slowly, but the results obtained with them help to support Dr. Lösener in his reassuring views as to the hygienic aspects of burial.

A PAPER of considerable interest, contributed by Dr. F. Ahlborn to the current number of one of our best-known contemporaries, contains a novel application of rowing to biology (*Zeit. f. wiss. Zool.*, lxi., December 1895). The main object of the paper is to explain the use and meaning of the asymmetrical types of tail-fin which are so commonly met with among fishes—*e.g.* the upturned tail of the shark and sturgeon, and the downwardly extended fin of the flying-fish. Dr. Ahlborn's explanation is founded on a recent suggestion of Prof. F. E. Schulze's in regard to the tail of Ichthyosaurus, and is illustrated by comparisons presumably drawn from the author's own experiences in the art of rowing. Every tyro knows the consequences which ensue if he holds his blade too obliquely in the water. If the upper edge is inclined too much towards the stern of the boat, a brisk pull upon the handle results in the blade jumping out of the water, and the oarsman falling backwards from his seat; if, on the other hand, the blade is inclined too much in the opposite direction, it digs into the water and the oarsman "catches a crab." The relevance of these illustrations is found in the fact that the skeletal support of the asymmetrical tails of fishes is generally such that either the upper or lower border of the fin is more resistant to the pressure of the water than the opposite border, a fact which causes the fin in action to assume an oblique, instead of a vertical position. The result of such a disposition is that in those cases where the upper part of the tail is stiffer than the lower the tail in locomotion is driven upwards, as the oar is driven out of the water (heterocercal tail of shark and sturgeon); while in cases where the lower part of the tail is firmer than the upper the tail tends, in action, to assume a lower position than the rest of the body (flying-fish). The body of the animal, in fact, is made to swing vertically about a horizontal axis running through the centre of gravity: in the first group the tail becomes elevated above the head, in the second group the head becomes raised above the tail. The utility of these types of organisation becomes obvious when we reflect, with Dr. Ahlborn, upon the habits of the creatures which exhibit them. The first group consists of bottom-haunting fish, which are thus enabled to give free play to their tails while scouring the sea-bottom in search of food; the second consists entirely of surface-swimming forms which are enabled, by this beautiful adaptation of structure, to swim swiftly beneath the surface of the water without the risk of their tails emerging, and so causing inconvenience and waste of force. The tails of many air-breathing aquatic animals, such as the crocodile, water-snake, and the extinct Ichthyosaurus, are constructed upon this latter principle.

THE number of the *Trinidad Field-Naturalists' Club* for October 1895, contains an elaborate paper by Mr. T. I. Potter, on four species of *Oncidium*, natives of the island.

THE Field Columbian Museum has commenced the issue of a series of botanical papers, with a contribution to the Flora of Yucatan, by Mr. C. F. Millspaugh, botanical curator, illustrated by several photographs. The orders which are most numerously represented in the Peninsula are the Leguminosæ and the Compositæ.

ATTRACTIVE, but somewhat belated, are the Brochures 3 and 4 of vol ii. of the *Proceedings* of the Rochester Academy of Science, just received by us. The papers contained in these publications were, for the most part, read before the Society in 1893. Among the subjects treated are: "The Evolution of the Ungulate Mammals," by Prof. H. L. Fairchild; "Solar Electrical Energy not transmitted by Radiation" by Dr. M. A. Veeder; and "The Pitch Lake of Trinidad," by Mr. A. Cronise.

THE editor of *Just's Botanischer Jahresbericht* has issued an appeal to all botanists for a prompt despatch of separate copies of their contributions to scientific journals, or other botanical treatises. The average number of such papers, an abstract of which is given in each year's *Bericht*, is about 5300; and of these the editor has never received, up to the present time, copies of more than 300. The papers should be addressed to the Editor, Prof. Dr. E. Koehne, Kirchstrasse 5, Friedenau-Berlin.

VOL. iii. No. 6 of the Contributions from the *U.S. National Herbarium* consists of an interesting account of the botany of Yakutat Bay, Alaska, by F. V. Coville, to which is prefixed a general report on the characteristics of the Flora, by F. Funston. Even in August the danger in crossing the bay in canoes is very great from the floating ice. The country is largely covered by impenetrable forests of the Sitka spruce, *Picea sitchensis*. The number of species of vascular plants gathered was 137, the predominant orders being Ranunculaceæ, Rosaceæ, Compositæ, and Gramineæ.

Bulletin No. 9 of the "Minnesota Botanical Studies" for 1895 contains an interesting article, by Mr. R. W. Squires, on Tree-temperatures. The observations were made between

January and June on a specimen of *Acer Negundo.* During the whole of this period the temperature of the tree was lower than that of the air in the morning and at noon, but higher in the evening. The lowest temperature of the tree recorded was in February, −21°·1 C. In the same part Miss H. G. Fox gives a monograph of the species of *Cypripedium* belonging to the Atlantic region of North America, six in number, with a scheme of the affinities of all the American species of the genus.

The fourth volume of the *Transactions* of the Royal Society of Victoria (1895, pp. 166) is taken up with "A Monograph of the Tertiary Polyzoa of Victoria," by the late Dr. MacGillivray. The monograph is illustrated by twenty-two lithographed plates, all of which were prepared by Dr. MacGillivray, but only a few pages of the descriptive text had been written, and Prof. Baldwin Spencer and Mr. T. S. Hall are responsible for the descriptions required to complete it. In Victoria, as well as in South Australia, there are numerous Tertiary formations containing large deposits of Polyzoa, the accurate determination of which, especially in relation to the living species, is of great geological interest. Dr. MacGillivray's monograph, with its numerous fine illustrations of species, will prove of great assistance in working out this relation.

The second volume on "Africa," in the new issue of Stanford's Compendium of Geography and Travel, deals with South Africa, and the author is Mr. A. H. Keane. The volume is not merely an enlarged edition of Keith Johnston's work, but practically a new publication, containing but a few passages of the original text, while only three of the old text-figures have been retained. Nnmerous new and carefully selected illustrations give attractiveness to the text, which is well abreast of the knowledge of African geography. How enormously the available information has increased may be gathered from the fact that the present volume, dealing with South Africa alone, runs into 671 pages; and we can quite believe Mr. Keane when he says: "Occurrences of far-reaching consequence have followed in such swift succession that in the preparation of this work the chief difficulty has been to keep pace with the shifting scenes." A broad view is taken of geography, attention being given to African history, political questions, and ethnology, as well as to the physical features, hydrography, and natural history of the continent. Altogether the volume is a valuable addition to the works dealing with Africa, and a desirable acquisition to every geographer's library.

The first volume of what promises to be a very elaborate "Traité de Chirurgie clinique et opératoire," has come to us from MM. J. B. Baillière et Fils. The editors of the work, which will be completed in ten bulky volumes, are Profs. A. Le Dentu and P. Delbet; and if the first volume, dealing with general and special pathology, is followed by others of like fulness and quality, a valuable work of reference will have been added to the literature of surgery. The chief object of the editors—the object towards which the efforts of all physicians and surgeons tend—will be to make the publication the *livre de chevet* of those who are concerned with the origin and treatment of diseases. It is the surgery of to-day that will be expounded, not that of the past. The recent conquests in the domain of anatomy, bacteriology with all its applications to therapeutical surgery, and operative methods which have extended the field of action of surgery, will all be fully dealt with. Such a broad scope, when considered by the side of the distinguished men who have undertaken to write the various sections, is sufficient to establish the work in a high position.

In a paper in the current number of the *Berichte* (January 13) by Lobry de Bruyn and A. van Ehenstein, further details are given of the properties of free hydrazine, $NH_2—NH_2$. In the first preliminary communication by M. Lobry de Bruyn, two methods of obtaining the anhydrous base were described, viz., by the action of barium oxide upon hydrazine hydrate, and by the reaction between sodium methylate and hydrazine hydrochloride in absolute methyl alcohol; in either case the hydrazine being separated by fractional distillation under reduced pressure. Free hydrazine is a liquid which at 23° has a density of 1·003, and on cooling with ice solidifies to a crystalline mass melting at 1°·4 C. Unlike free hydroxylamine, which is explosive, hydrazine is a very stable body, boiling unchanged under ordinary atmospheric pressure at 113°·5 C., and not decomposing at a temperature of 300°. In its chemical behaviour the free base resembles the hydrate, being oxidised to nitrogen by oxygen or air, and converting solid sulphur into hydrogen sulphide on warming. In a subsequent note in the same journal, by M. Lobry de Bruyn, an improved method is given for the preparation of hydrazine hydrate in quantity, advantage being taken of the fact that glass is not attacked by this substance at temperatures under 50° C. Since the hydrate boils at 47° under a pressure of 26 mm., the fractional distillation, if conducted at pressures below this, may be carried out in glass vessels.

The additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus*, ♂) from India, presented by Mr. Edmund Sheriff; a Common Boa (*Boa constrictor*) from Trinidad, presented by Mr. S. A. Cumberland; a —— Antelope (*Cervicapra*) from Africa, a Kinkajou (*Cercoleptes caudivolvulus*) from South America, a Cormorant (*Phalacrocorax carbo*), British, two Samoan Fruit Pigeons (*Ptilonopus apicalis*) from Samoa, deposited; a Sharp-nosed Snake (*Passerita mycterizans*) from India, purchased.

OUR ASTRONOMICAL COLUMN.

Eclipses in February.—During the present month there will be an annular eclipse of the sun and a partial eclipse of the moon. The former will occur on February 13, but as the path of the annulus lies wholly in the South Atlantic and Antarctic Oceans, it is of little interest. At the Cape of Good Hope it will be visible as a partial eclipse, magnitude 0·849, the greatest phase occurring at 6h. 38m. Cape mean time, that is, sixteen minutes before sunset.

The more important phases of the partial eclipse of the moon on February 28 will be visible in this country, provided the weather be favourable. The following particulars for Greenwich are from the *Companion to the Observatory*:—

	h. m.		h. m.
First contact with penumbra	5 15·5	... With shadow	6 16·3
Last ,, ,,	10 15·9	... ,, ,,	9 15·1

First contact with shadow takes place at an angle of 85° from the north point towards the east, and the last contact at 30° towards the west. The magnitude of the eclipse (moon's diameter = 1) will be 0·870. The moon will rise at 5h. 27m.

During the partial eclipse the following stars will be occulted:

Star.	Mag.	Disappearance or Reappearance.	G.M.T.	Angle E. of N.
			h. m.	
B.D. +7°·2373	9·3	D	6 42	81
+6·2364	8·8	D	7 6	147
+7·2370	9·5	R	7 7	325
+7·2373	9·3	R	7 28	334
+7·2364	8·8	R	7 56	270

Astrophysical Standards.—The need for greater uniformity in standards, &c., has long been felt by all engaged in astrophysical researches, and we learn with pleasure that the Editorial Board of the *Astrophysical Journal* has taken up the matter. As the result of a circular addressed to the Associate Editors, the following decisions have been arrived at, and an